

Supplemental Table 1. Virtual hip exam.**For Patients: Instructions to be provided PRIOR to the scheduled telehealth visit.**

Clothing: Exposure of both knees is required. Wear a pair of gym shorts that are at least 3" above the knee. Shoes and socks off.

Exam Space: 10 to 15 feet of open space should be available to allow the patient to move away from the camera and provide perspective as well as observation of gait.

Position: The examination will be conducted in 3 positions: (1) standing, (2) supine (lying flat), and (3) sitting. Initially, the patient should stand 4 to 5 feet from the camera but will be asked to move closer to or further away from the camera during portions of the examination.

Camera Position:

1. Standing: Hip level in order to view the patient from the waist to the feet (use a table or someone holding computer/phone/tablet).
2. Sitting: On a stool/high chair with feet just touching or not touching the floor. Camera at waist level with belly to feet visible.
3. Supine/Lateral/Prone: Body level to capture lower abdomen and both legs from hips to ankles.

Additional Items: Common household items—firm couch, pillow, towel, and a chair.

For Physicians:

The left column contains the physical exam component. The middle column contains recommended medical record documentation fields. The right column contains standardized verbal instructions in layman's terms that the clinician may provide to the patient for each physical exam component.

The virtual examination has been modified to allow patients to perform each component independently; those marked by an asterisk may be performed with the assistance of a remote examiner.

Physical Exam Component	Documentation	Verbal Instructions for Patient
Lumbar spine		
Extension	<input type="checkbox"/> ROM within normal limits <input type="checkbox"/> ROM limited <input type="checkbox"/> Painful	"We are going to start by examining your lower back."
Flexion	<input type="checkbox"/> ROM within normal limits <input type="checkbox"/> ROM limited <input type="checkbox"/> Painful	"Stand so that your side is facing the camera. Make sure there is a chair or another examiner behind you to support you in the case you fall. Place your hands on your hips and lean back as far as you are able to. Does this cause pain? Where?"
Lateral bend	<input type="checkbox"/> ROM within normal limits <input type="checkbox"/> ROM limited RIGHT <input type="checkbox"/> ROM limited LEFT <input type="checkbox"/> Painful	"Stand so that your side is facing the camera. Place your hands on your hips and bend forward at your hips as far as you are able to. Does this cause pain? Where?"
Rotation	<input type="checkbox"/> ROM within normal limits <input type="checkbox"/> ROM limited RIGHT <input type="checkbox"/> ROM limited LEFT <input type="checkbox"/> Painful	"Stand so that you are facing the camera. Place your hands on your hips and bend your torso to the left and then to the right as far as you are able to. Does this cause pain? Where?"
SLR*	<input type="checkbox"/> Negative <input type="checkbox"/> Positive	"Stand so that you are facing the camera. Place your hands on your hips and rotate your torso to the left and then to the right as far as you are able to. Does this cause pain? Where?"
Hip		
Standing exam		
Inspection	<input type="checkbox"/> Normal	"Please stand facing the camera so that I can see the front of your hips."
	<input type="checkbox"/> Abrasion	
	<input type="checkbox"/> Swelling	"Now, turn sideways so that I can see your (right/left) hip from the side."
	<input type="checkbox"/> Drainage	
	<input type="checkbox"/> Rash	"Now, turn so I can see the buttock region (right/left)."
	<input type="checkbox"/> Ecchymosis	
	<input type="checkbox"/> Erythema	
	<input type="checkbox"/> Scar(s)	
	<input type="checkbox"/> Healed incision(s)	
	<input type="checkbox"/> Healing incision(s)	
	<input type="checkbox"/> Other:	

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Table 1. (continued)

Atrophy	<input type="checkbox"/> None <input type="checkbox"/> Rectus Femoris <input type="checkbox"/> Gluteus Maximus <input type="checkbox"/> Other:	
Pain location	<input type="checkbox"/> None <input type="checkbox"/> Groin <input type="checkbox"/> Hip flexor <input type="checkbox"/> Adductor <input type="checkbox"/> Pubic symphysis <input type="checkbox"/> ASIS <input type="checkbox"/> Lower abdomen <input type="checkbox"/> Greater trochanter <input type="checkbox"/> Piriformis <input type="checkbox"/> Sacroiliac <input type="checkbox"/> Ischial tuberosity <input type="checkbox"/> Proximal hamstring <input type="checkbox"/> G. Maximus tendon <input type="checkbox"/> Other:	<p>“Does your hip hurt anywhere specifically? If so, please point to the location using one finger.”</p>
Alignment	<input type="checkbox"/> Neutral <input type="checkbox"/> Scoliosis <input type="checkbox"/> Lordotic <input type="checkbox"/> Kyphotic <input type="checkbox"/> Pelvic retrotilt <input type="checkbox"/> Pelvic anterior tilt <input type="checkbox"/> Leg length discrepancy	<p>“Stand facing the camera so that the I can see you from the waist level to your feet. Now, turn so that I can see the side of your painful hip. Turn again so that you are facing away from the camera so that I can see the buttock region.”</p>
Gait	<input type="checkbox"/> Antalgic <input type="checkbox"/> Coxalgic <input type="checkbox"/> Trendelenburg <input type="checkbox"/> Flexed knee <input type="checkbox"/> Flexed hip <input type="checkbox"/> Short-legged <input type="checkbox"/> Steppage <input type="checkbox"/> Other:	<p>“Please walk directly away from the camera for at least four steps. Turn around and face the camera. Now walk directly back toward the camera to your starting position. Turn around and walk away from the camera and then again back toward the camera. Now stand facing away from the camera and place your hands on your hips. Stand on your good leg and bend the knee of your affected hip slightly so that your foot is off the floor. Hold the position for 30 seconds and maintain your balance to the best of your ability. Now do the same, standing on your affected leg for 30 seconds.”</p>
Ambulatory assist	<input type="checkbox"/> None <input type="checkbox"/> Cane <input type="checkbox"/> Crutch x1 <input type="checkbox"/> Crutch x2 <input type="checkbox"/> Walker <input type="checkbox"/> Wheelchair	<p>“Do use an ambulatory assist like a cane, walker, or wheelchair when you are walking?”</p>
Knee progression	<input type="checkbox"/> Neutral <input type="checkbox"/> Internal <input type="checkbox"/> External	<p>“We will evaluate your knee progression during the gait portion of the exam.”</p>
Foot progression	<input type="checkbox"/> Neutral <input type="checkbox"/> Internal <input type="checkbox"/> External	<p>“We will evaluate your foot progression during the gait portion of the exam.”</p>
Special tests		
Long Stride Walking Test—(ischiofemoral impingement)	<input type="checkbox"/> Normal <input type="checkbox"/> Posterior hip pain with terminal extension	<p>“Walk again away from the camera and take very long strides. Does this cause pain?”</p>
Traditional squat—(subspine impingement)	<input type="checkbox"/> Normal <input type="checkbox"/> Painful	<p>“Stand facing the camera, keeping feet and knees shoulder width apart. Slowly squat down, trying to keep your knees in the same plane as your feet. Does this cause pain?”</p>
Knock knee squat—(FADIR)	<input type="checkbox"/> Normal <input type="checkbox"/> Painful	<p>“Stand facing the camera, keeping your feet shoulder width apart and your knees as close together as possible. Slowly squat down. Does this cause pain?”</p>

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Table 1. (continued)

Seated exam		“Now sit on a chair that high enough so that your feet are either just touching the floor or are off the floor. Face the camera so that I can see from your waist to your feet.”
Range of motion (ROM)		
External rotation	<input type="checkbox"/> Painful <input type="checkbox"/> 0 <input type="checkbox"/> 10 <input type="checkbox"/> 20 <input type="checkbox"/> 30 <input type="checkbox"/> 40 <input type="checkbox"/> 50 <input type="checkbox"/> 60 <input type="checkbox"/> 70 <input type="checkbox"/> 80 <input type="checkbox"/> 90	“Flex your hip just past 90 degrees and rotate your leg so that your knee moves outwards and your foot moves inwards. Try to find a comfortable end point and hold the position for 5 seconds. Does this cause pain?”
Internal rotation	<input type="checkbox"/> Painful <input type="checkbox"/> 0 <input type="checkbox"/> 10 <input type="checkbox"/> 20 <input type="checkbox"/> 30 <input type="checkbox"/> 40 <input type="checkbox"/> 50 <input type="checkbox"/> >50	“Next, flex your hip just past 90 degrees and rotate your leg so that your knee moves inwards and your foot moves outwards. Try to find a comfortable end point and hold the position for 5 seconds. Does this cause pain?”
Special tests		
FADIR – Flexion Adduction Internal Rotation (Classic impingement test for femoroacetabular impingement)	<input type="checkbox"/> Negative <input type="checkbox"/> Positive	“Stay seated on the chair, keeping your feet apart, just beyond the width of your pelvis. Gradually bring your knees together as close as you can. Does this cause pain?”
Supine exam		“We are now going to examine you lying down. Please lie down on a firm couch with your head on a pillow, positioned perpendicular to the camera so that I can see from your lower abdomen down to your feet”
Range of motion		
Thomas’ test/extension (capsular contracture or iliopsoas tightness)	<input type="checkbox"/> Normal <input type="checkbox"/> Flexion contracture 5 <input type="checkbox"/> Flexion contracture 10 <input type="checkbox"/> Flexion contracture 15 <input type="checkbox"/> Flexion contracture 20 <input type="checkbox"/> Flexion contracture >20	“Please flex both your hips and knees so that your knees come as close as you can bring them to your chest. Use your hands to help you. Now keeping your unaffected hip in the flexed position, slowly begin to straighten your hip and knee on the affected side, to bring the leg flat on the couch. Are you able to do this?”
Flexion	<input type="checkbox"/> Painful <input type="checkbox"/> 0 <input type="checkbox"/> 10 <input type="checkbox"/> 20 <input type="checkbox"/> 30 <input type="checkbox"/> 40 <input type="checkbox"/> 50 <input type="checkbox"/> 60 <input type="checkbox"/> 70 <input type="checkbox"/> 80 <input type="checkbox"/> 90 <input type="checkbox"/> 100 <input type="checkbox"/> 110 <input type="checkbox"/> 120	“As we just did, please flex your hip and knee on the affected side as far as you are able. Try to keep your knee in line with your shoulders. Use your hands to assist. Does this cause pain?”
Special tests		
Subspine impingement	<input type="checkbox"/> Negative <input type="checkbox"/> Positive	“Flex your hip and knee on the affected side as far as you are able. Try to keep your knee in line with your shoulders. Use your hands to assist. Does this cause pain?”

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Table 1. (continued)

FABER – Flexion Abduction External Rotation (superolateral impingement/anterior capsular irritation)	<input type="checkbox"/> Negative <input type="checkbox"/> Positive	“Now, place the ankle of your affected leg onto the knee of your unaffected leg, making a figure-4 type configuration with your legs. Relax your inner thigh muscles and allow the knee of your affected leg to drop down as far as it will go towards the floor. Does this cause pain?”
Apprehension	<input type="checkbox"/> Negative <input type="checkbox"/> Positive	“Extend your affected leg off the couch and down towards the floor. Do you feel pain in your groin area?”
Circumduction click	<input type="checkbox"/> Negative <input type="checkbox"/> Positive	“Keeping your knee straight, lift your leg off the couch and draw a large imaginary circle with your foot, generating all the motion from your hip joint. Try to make 3 revolutions. Does this cause a click in your hip? Is it painful?”
Resisted adduction (athletic pubalgia)	<input type="checkbox"/> Negative <input type="checkbox"/> Positive	“While lying flat, bend both your knees to the 90 degree position, keeping your knees and feet together. Place a rolled-up towel in between your knees and squeeze your knees together. Do you feel pain in the groin area?”
Resisted abdominal curl (athletic pubalgia)	<input type="checkbox"/> Negative <input type="checkbox"/> Positive	“While lying flat, bend both your knees to the 90 degree position. Perform an abdominal curl. Do you feel pain in the pubic area?”
Lateral exam		“Now, turn on your unaffected side facing the camera.”
Range of motion		
Abduction	<input type="checkbox"/> Painful <input type="checkbox"/> 0 <input type="checkbox"/> 10 <input type="checkbox"/> 20 <input type="checkbox"/> 30 <input type="checkbox"/> 40 <input type="checkbox"/> 50 <input type="checkbox"/> >50	“Now, turn on your unaffected side facing the camera. With your knee straight, please lift your leg up in the air as far as you can. Does this cause pain?”
Special tests		
Ober test (Iliotibial band tightness)	<input type="checkbox"/> Negative <input type="checkbox"/> Positive	“You will need to be on your unaffected side on the couch, facing the camera. Keeping your affected leg up in the air, in line with your trunk and with your knee straight, gently bring your leg down towards the couch. Are you able to bring your leg all the way down so that it touches the couch? Does this cause pain or clicking at the outside of your hip?”
Ischiofemoral impingement	<input type="checkbox"/> Negative <input type="checkbox"/> Positive	“Continue lying on your unaffected side on the couch, facing the camera. Extend your affected leg behind your body with your knee straight and gently bring your leg down toward the couch behind your body. Does this cause pain in the back of your hip? Is the pain relieved when you lift your leg off of the couch?”
Prone exam		“Now, lie face down on the couch.”
Special tests		
PART – Prone Apprehension Relocation Test (anterior hip instability)	<input type="checkbox"/> Negative <input type="checkbox"/> Positive	“Keeping your knees together and bent at 90 degrees, gently allow your affected leg to rotate and drop down towards the unaffected leg. You may not be able to touch the other leg. Does this cause pain at the front of your hip?”
Neurovascular		
Sensation (Gen)	<input type="checkbox"/> LFCN <input type="checkbox"/> AFCN <input type="checkbox"/> PFCN <input type="checkbox"/> Obturator <input type="checkbox"/> SPN <input type="checkbox"/> DPN <input type="checkbox"/> Tibial <input type="checkbox"/> Sural <input type="checkbox"/> Saphenous	“Do you have any areas of numbness, burning, or tingling? If so, please point to these areas.”
Sensation (Spec)		“We are going to test sensation in some specific locations. Please use your other hand to touch . . .”

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Table 1. (continued)

Lateral femoral cutaneous nerve	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	“... the outside part of both thighs.”
Anterior femoral cutaneous nerve	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	“... the front of both thighs.”
Posterior femoral cutaneous nerve	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	“... the back of both thighs.”
Obturator	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	“... the inside both upper thighs.”
Superficial peroneal nerve	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	“... the top of both feet.”
Deep peroneal nerve	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	“... the webspace between your big toe and the second toe.”
Tibial	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	“... the bottom center of both feet.”
Sural	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	“... the outside of both feet.”
Saphenous	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	“... the inside of both calves.”
Motor (Gen)	<input type="checkbox"/> TA <input type="checkbox"/> GS <input type="checkbox"/> Intact distally	“Do you feel weak with any particular movements? If so, what feels weak?” “Do the following—walk on your toes for several step. Now turn and walk several steps on your heels in the other direction.”
Motor (Spec)*		“We are going to test the strength of some specific muscles.”
Iliopsoas (L2–3)	Remote examiner <input type="checkbox"/> Unable <input type="checkbox"/> Very weak <input type="checkbox"/> Somewhat weak <input type="checkbox"/> Symmetric	“Bend both knees to 90 degrees. The examiner will place his/her hand on your thigh and resist as you attempt to bring your knee toward your chest. The examiner will test one leg at a time. The examiner will describe the strength as ‘very weak’, ‘somewhat weak’, or ‘same as other side’.”
Quadriceps (L3–4)	Remote examiner <input type="checkbox"/> Unable <input type="checkbox"/> Very weak <input type="checkbox"/> Somewhat weak <input type="checkbox"/> Symmetric	“Bend both knees to 90 degrees. The examiner will place his/her hand on your shin and resist as you attempt to straighten out your knee. The examiner will test one leg at a time. The examiner will describe the strength as ‘very weak’, ‘somewhat weak’, or ‘same as other side’.”
Hamstrings (L5)	Remote examiner <input type="checkbox"/> Unable <input type="checkbox"/> Very weak <input type="checkbox"/> Somewhat weak <input type="checkbox"/> Symmetric	“Lay face down on your belly with your legs straight. The examiner will place his/her hand on your heel and will resist as you attempt to bend your knee. The examiner will test one leg at a time. The examiner will describe the strength as ‘very weak’, ‘somewhat weak’, or ‘same as other side’.”
Adductors (L2-3)	Remote examiner <input type="checkbox"/> Unable <input type="checkbox"/> Very weak <input type="checkbox"/> Somewhat weak <input type="checkbox"/> Symmetric	“Bend both knees to 90 degrees with your legs apart and the inside borders of your feet touching one another. The examiner will place his/her hands on the inside of each knee and will resist as you attempt to bring your knees together. The examiner will describe the strength as ‘very weak’, ‘somewhat weak’, or ‘same as other side’.”
Abductors (L5)	Remote examiner <input type="checkbox"/> Unable <input type="checkbox"/> Very weak <input type="checkbox"/> Somewhat weak <input type="checkbox"/> Symmetric	“Bend both knees to 90 degrees with knees and feet together. The examiner will place his/her hands on the outside of each knee and will resist as you attempt to separate your knees while keeping your feet together. The examiner will describe the strength as ‘very weak’, ‘somewhat weak’, or ‘same as other side’.”

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Table 1. (continued)

Tibialis Anterior (L5)	Remote examiner <input type="checkbox"/> Unable <input type="checkbox"/> Very weak <input type="checkbox"/> Somewhat weak <input type="checkbox"/> Symmetric	"The examiner will place his/her hands on the top of each foot. The examiner will resist as you attempt to bend your ankles up so your toes point toward your face, as if you are easing off of the gas pedal. The examiner will test both ankles at the same time and describe the strength as 'very weak', 'somewhat weak', or 'same as other side'."
Extensor hallucis longus (L5)	Remote examiner <input type="checkbox"/> Unable <input type="checkbox"/> Very weak <input type="checkbox"/> Somewhat weak <input type="checkbox"/> Symmetric	"The examiner will place his/her hands on the top of each big toe. The examiner will resist as you attempt to point your big toes toward your face. The examiner will test both big toes at the same time and will describe the strength as 'very weak', 'somewhat weak', or 'same as other side'."
Gastrocnemius/Soleus (S1)	Remote examiner <input type="checkbox"/> Unable <input type="checkbox"/> Very weak <input type="checkbox"/> Somewhat weak <input type="checkbox"/> Symmetric	"The examiner will place his/her hands on the bottom of each foot. The examiner will resist as you attempt to press your feet down, as if you are pressing down on the gas pedal. The examiner will test both legs at the same time and will describe the strength as 'very weak', 'somewhat weak', or 'same as other side'."
Peroneals (S1)	Remote examiner <input type="checkbox"/> Unable <input type="checkbox"/> Very weak <input type="checkbox"/> Somewhat weak <input type="checkbox"/> Symmetric	"The examiner will place his/her hands on the outside border of each foot. Resist the examiner as he/she pushes on the outside border of each foot. The examiner will test both legs at the same time and will describe the strength as 'very weak', 'somewhat weak', or 'same as other side'."
Flexor hallucis longus (S2)	Remote examiner <input type="checkbox"/> Unable <input type="checkbox"/> Very weak <input type="checkbox"/> Somewhat weak <input type="checkbox"/> Symmetric	"The examiner will place his/her hands on the bottom of each big toe. The examiner will resist as you attempt to point your big toes toward the ground. The examiner will test both big toes at the same time and will describe the strength as 'very weak', 'somewhat weak', or 'same as other side'."
Circulation		"We are going to test the circulation of your extremities."
Well perfused	<input type="checkbox"/> Symmetric <input type="checkbox"/> Cooler <input type="checkbox"/> Warmer	"Does your foot feel the same temperature on both sides?"
Capillary refill	<input type="checkbox"/> <2 seconds <input type="checkbox"/> >2 seconds	"Using your thumb, press your toenail until it turns white. Then, release your thumb and allow it to pink back up. How long did it take to pink back up?"
Pitting edema	<input type="checkbox"/> None <input type="checkbox"/> Mild <input type="checkbox"/> Moderate <input type="checkbox"/> Severe	"Make sure the camera is able to see your lower leg. Using two fingers, press down on the front of your shin just above your ankle."
Calf pain	None	"Squeeze your calf with both hands. Does this cause you pain?"
Homan	<input type="checkbox"/> Negative <input type="checkbox"/> Positive	"Use a towel to pull your ankle up as if you are stretching your calf. Does this cause you pain?"
Beighton criteria		"Each of the following tests should be done on the right and left side."
Thumb-to-forearm	RIGHT <input type="checkbox"/> Positive <input type="checkbox"/> Negative LEFT <input type="checkbox"/> Positive <input type="checkbox"/> Negative	"Each of the following tests should be done on the right and left side. Bend your wrist. Now, bend your thumb down and try to make it touch it to your forearm."
Fifth Metacarpophalangeal joint >90	RIGHT <input type="checkbox"/> Positive <input type="checkbox"/> Negative LEFT <input type="checkbox"/> Positive <input type="checkbox"/> Negative	"Bend your pinky back as far as it will go"

(continued)

Table 1. (continued)

Elbow >10	RIGHT <input type="checkbox"/> Positive <input type="checkbox"/> Negative LEFT <input type="checkbox"/> Positive <input type="checkbox"/> Negative	“Stand perpendicular to the camera, straighten your elbows as far as they go.”
Knee >10	RIGHT <input type="checkbox"/> Positive <input type="checkbox"/> Negative LEFT <input type="checkbox"/> Positive <input type="checkbox"/> Negative	“Step back from the camera and stand perpendicular to it, straighten your knees as far as they go.”
Palms to floor	<input type="checkbox"/> Positive <input type="checkbox"/> Negative	“Bend at the waist while keeping your knees straight, and attempt to place both palms on the floor.”